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SHORT COMMUNICATION

IODINE DETERMINATION IN PLANT, WATER, CRAB AND SEDIMENT OBTAINED IN AKURE, ONDO STATE, NIGERIA

Abulude, Francis Olawale
Science and Education Development Institute, Akure, Ondo State, Nigeria

ABSTRACT

Iodine is an essential element required for thyroid hormone synthesis. It contains some of antioxidant and antiproliferative activity in the prevention and treatment of cardiovascular disease and cancer. In this paper efforts have been made to quantify iodine content in samples obtained from a dam in Akure, Ondo State, Nigeria. The iodine content in the samples was found to be low. It was recommended that supplements should be taken as at when due or neccessary.

KEYWORDS: Iodine, thyroid hormone, crab, water, dam, deficiency.

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Corresponding Author: waleabul@yahoo.com

INTRODUCTION

Iodine is an element that is needed for the production of thyroid hormone. According to American Thyroid Association (2015), the body does not make iodine, so it is important constituent of the diet. These hormones control the body's metabolism, for proper bone and brain development during pregnancy and infancy and many other important functions (NIH, 2011). Gong and Zhang (2013) researched on water samples and found out that iodide, iodate and organo-iodine were the dissolved iodine species present in the samples. This work was carried out to determine the iodine distributions in plant, water, crab and sediments obtained in a dam within Akure, Ondo State, Nigeria.

MATERIALS AND METHOD

Sample collection

The water, sediment, water lettuce and crab samples were obtained from Water Corporation Dam located on the Federal College of Agriculture Akure, Campus, Nigeria. The crab sample was separated into its anatomical bits namely abdomen, legs, eyes, cheliped and carapace. The samples were washed in tap water and rinsed with distilled water; oven dried at 105°C, ground, sieved (2mm) and kept in airtight containers prior to analysis. The water sample was filtered and stored in airtight container.

Sample preparation
The sample (0.5g) was wet ashed using 2M HCL and made up to 50cm^3

Determination
The iodine liberated from the digestion process was then titrated against freshly prepared 0.001M Sodium Thiosulphate using 2 drops of 1% starch solution as indicator. The iodine content of each sample was then estimated from the volume of the titrant used. All analyses were carried out in triplicate.

The statistical analyses were performed with Minitab 16 software.

RESULT AND DISSCUSSION

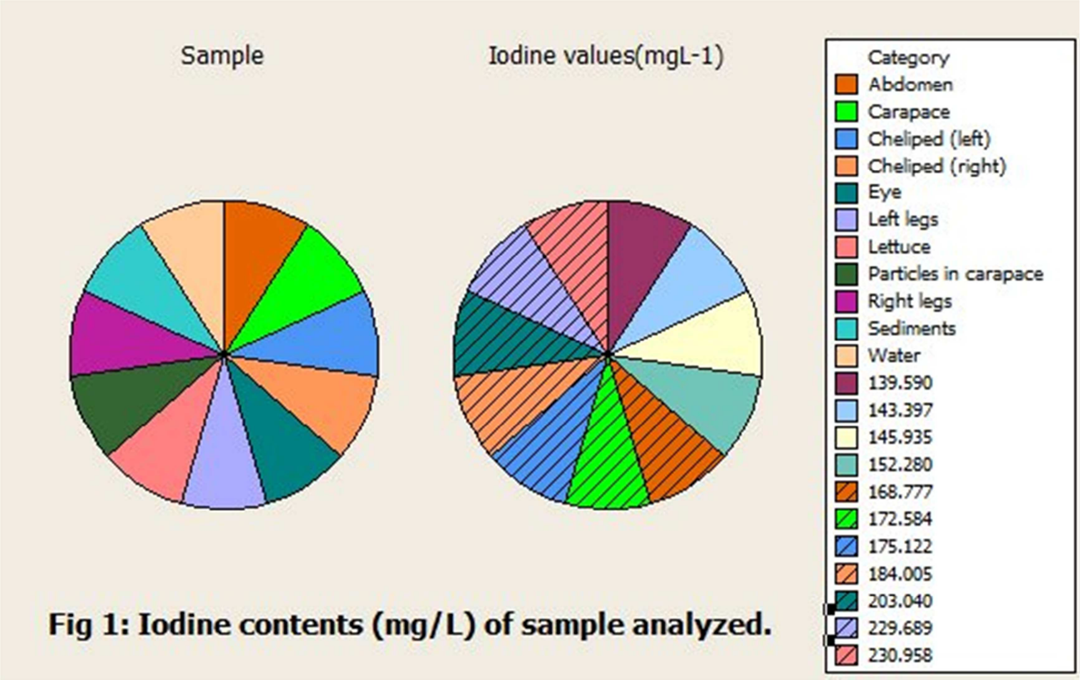

Fig 1: Iodine contents (mg/L) of sample analyzed.

DISCUSSION

The iodine content (mg/L) in samples analyzed is depicted in Fig 1. Iodine content was high in particles of the carapace, though it was higher in carapace (230.96 mg/L) the sediment and Eye were low in iodine content and ranged from 148.40 to 168.8 mg/L respectively. Iodine content of water was 139.59 mg/L. The results obtained from this study were in total agreement with values recorded for some foods in Britain (Wenlock *et al*., 1982) and Nigeria (Abulude, 2004). The RDA of iodine is 150 µg day^{-1}. National Research Council (NAS/NRC, 1980) recommended an intake of 150 µg iodine for adults. The minimum intake to prevent goiter is 50 µg day^{-1}

According to Akindahunsi *et al.* (1993) in Western Germany, where remains a lot of concern that the iodine intake might British rejects ingest an average of 255 µg day $^{-1}$, infants, toddlers and teenagers in America have been estimated to ingest up to 395, 368 and 955 µg day^{-1} and these values seem to be on the increase (Wenlock *et al*., 1982). However, other reports seen to indicate that intake in the USA is now on the decrease. Swedish pensioners have been estimated to have average intake of 318 and 246 µg day^{-1} for men and women respectively (Wenlock *et al*., 1982) Presently in Nigeria, major source of iodine (milk, bread, meat and fish) are taken only occasionally because of cost considerations. Rice, cassava and cassava products are more consumed by the populace. Different processing methods of food preparation are attributed to nutrient loss in foods. This has affected iodine contents loss due to volatilization.

People in deficient areas can receive iodine as an additive to food, water or by direct administration. Direct administration of iodine is usually in form of iodized oil, but potassium iodine or iodine in Lugol’s solution can also be given, iodine is a lot usually added at a ratio of salt between 1:10,000 and 1:50,000 the level can be adjusted for estimated daily consumption of salt, which varies from less than 3g a day to 15g per day (Hetzet and Dunn, 1989). Administration of iodized oil requires direct contact with each target subject in contact to iodized salt. Iodized oil requires direct contact with target subject in contact with iodized salt. Iodized oil has usually been administrated via the primary health care system. Iodized oil provides adequate iodine for several years after its initial administration. Iodine has also been added to a number of foods, which include: bread, candy and vitamin tablets.

CONCLUSION

Particles in the carapace, eyes, cheliped, carapace, abdomen, legs (crab), sediment, water and lettuce were good source of iodine. The iodine content of all other basic foods was found to be low. It is very likely that prolonged intake of these foods may result in iodine deficiency. However, fortification of foods and water with iodine could correct this deficiency.

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